

Title of PhD project / theme	Examining the association respiratory co-infections and chronic cough with and undetected transmission of Mycobacterium tuberculosis
Supervisory team	<p>Dr Rein Houben (<a href="mailto:Rein.Houben@lshtm.ac.uk">Rein.Houben@lshtm.ac.uk</a>)</p> <p>Prof Koya Ariyoshi (<a href="mailto:kari@nagasaki-u.ac.jp">kari@nagasaki-u.ac.jp</a>)</p>
Brief description of project / theme	<p>The transmission of Mycobacterium tuberculosis (Mtb), the causative agent of tuberculosis (TB) disease remains poorly understood, and as a consequence is mostly undetected, hindering efforts to control TB globally. A recent hypothesis is that individuals with low-level infectious TB disease ('subclinical TB') experience periods of high infectiousness due to transient respiratory tract infections, or chronic cough from other causes. (1)</p> <p>This PhD project will examine this hypothesis through 3 sub-projects;</p> <p>i) Analysis of Japan electronic health records to examine the incidence, prevalence and duration of acute and chronic cough in the general population and a retrospective cohort of TB cases.</p> <p>ii) Comparison of respiratory co-infections in newly diagnosed TB patients and non-TB controls in The Philippines and also possibly in Vietnam. (2, 3)</p> <p>iii) Build and analyse a dynamic transmission model of TB disease that reflects potential contribution of transient and chronic cough, and incorporates the data from sub-project i) and ii). The objective is to provide quantitative estimates of the proportion of all transmission that is potentially caused by non-TB acute and chronic cough.</p> <p>References</p> <ol style="list-style-type: none"> <li>1. Esmail H, Dodd PJ, Houben RMGJ. Tuberculosis transmission during the subclinical period: could unrelated cough play a part? <i>Lancet Respir Med.</i> 2018 Apr 1;6(4):244–6.</li> <li>2. Shimazaki T, Taniguchi T, Saludar NRD, Gustilo LM, Kato T, Furumoto A, et al. Bacterial co-infection and early mortality among pulmonary tuberculosis patients in Manila, The Philippines. <i>Int J Tuberc Lung Dis.</i> 2018 Jan 1;22(1):65–72.</li> </ol>

	<p>3. Yoshida LM, Suzuki M, Thiem VD, et al., Population based cohort study for pediatric infectious diseases research in Vietnam. Trop Med Health. 2014 Jun;42(2 Suppl):47-58</p>
<p>The role of LSHTM and NU in this collaborative project</p>	<p>The LSHTM supervisor (Dr Houben) has extensive experience in TB epidemiological studies and mathematical modelling. The Nagasaki supervisor (Prof Ariyoshi) is an infectious disease physician, with extensive experience of clinical research and connection respiratory research in Asia (needed for objective i). His group runs a multiplex PCR that examines samples for the presence of 13 viral and six bacteriological common respiratory pathogens (objective ii)</p>
<p>Particular <i>prior</i> educational requirements for a student undertaking this project</p>	<p>MSc with substantial quantitative component. Clinical training is welcome, but not required. Strong English writing skills are desirable.</p>
<p>Skills we expect a student to develop/acquire whilst pursuing this project</p>	<p>Analysis of large datasets (sub-project i), mathematical modelling (sub-project ii) and PCR experiments.</p>